REMARKS

Claims 1-30 are currently pending in the subject application and are presently under consideration. Claims 1, 3, 4, 7, 9-12, 14, 16-22, and 24-30 have been amended as shown on pages 2-14 of the Reply. Claims 8 and 23 have been cancelled.

Applicants' representative thanks Examiner Fitzpatrick for the courtesies extended during the telephonic interview conducted on February 23, 2009. During the interview, the Examiner recommended a number of clarifying modifications to the wording of the proposed amendments, and requested additional clarification of terms used in the claims. The amended claim set herein incorporates the suggestions offered by the Examiner during the interview.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Rejection of Claims 1-30 Under 35 U.S.C. §101

Claims 1-30 stand rejected under 35 U.S.C. §101 because the Examiner contends that claimed invention is directed to non-statutory subject matter. Independent claims 1 and 16 have been amended herein to address the Examiner's concerns in this regard. Specifically, independent claim 1 has been amended to tie the disclosed method to a processor (support for which can be found at paragraph [0087] of the specification), while independent claim 16 has been amended to disclose that the data representing sequences of instructions is embodied on a computer-readable *storage* medium, thereby precluding non-physical signal interpretations. Paragraph [0088] of the specification includes several examples of such computer-readable storage media. In view of these amendments, it is respectfully submitted that this rejection should be withdrawn.

II. Rejection of Claims 1-5, 13, 16-20, and 28 Under 35 U.S.C. §103(a)

Claims 1-5, 13, 16-20, and 28 stand rejected under 35 U.S.C. §103(a) as being unpatentable USPN 5768478 (Batten) in view of USPN 6285785 (Bellegarda, *et al.*), USPN 6847731 (Caulfield), and USPN 7136710 (Hoffberg, *et al.*). It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Batten, Bellegarda, *et al.*,

Caulfield, and Hoffberg, *et al.*, individually or in combination, do not teach or suggest all aspects set forth in the subject claims.

> A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *KSR v. Teleflex*, 550 U.S. ___, 127 S. Ct. 1727 (2007) citing Graham v. John Deere Co. of Kansas City, 383 U. S. 1, 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (*quoting Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))).

The subject claims relate to a computer learning model used for signal recognition. Incoming signals representing human input (*e.g.* handwriting or speech) can be categorized into groups according to a number of characteristics, such as the respective demographics of the signal originators, the context under which the signals were generated, or other such characteristics. Each signal within each group can be classified as falling within a range of values for a variable associated with the group's representative characteristic, and the sets of signals within each group can be determined according to these ranges of values. An accuracy score for each set of input signals within each group can be determined, and the accuracy scores for each set can be weighed based on the relative importance of the range of variable values corresponding to the set. This can allow, for example, input signals from a particular demographic to be biased over other demographics, or input signals originating from a particular application to be favored over those from other applications. The variables used to categorize the signal sets for accuracy determinations can also include a user scenario variable, which represents a context under which the input signal was generated. This variable can, for example, describe a signal as originating at a particular software application or as a result of a particular operation performed using such a software application. In particular, amended independent claim 1 recites, *identifying a first group of signal sets representing human inputs using one or more processors,* ***each signal set of the first group having an associated range of values for a variable corresponding to the first group****, the variable being one of a plurality of variables having values characterizing multiple signals to be processed,* ***the plurality of variables including at least a variable characterizing a user scenario in which a signal was generated, the user***

scenario including at least one of a software application or an operation performed within a software application.

As conceded in the Office Action, neither Batten nor Bellegarda, *et al.* disclose such user scenario variables. The Examiner argues that Hoffberg, *et al.* makes up this deficiency. Hoffberg, *et al.* relates to an adaptive interface used to program a consumer or industrial device or interface, such as a VCR. The adaptive interface predicts likely inputs expected from a user based on the user's historical inputs and preferences. The Examiner notes in particular that the cited reference relies on explicit or implicit user identification to leverage the user's history and preferences when generating predictions. However, amended independent claim 1 expressly discloses that the variable values representing a user scenario in which a signal was generated include at least one of a *software application* that generated the signal or an *operation performed within the software application* that originated the signal. Such a user scenario variable is not in any way suggested by the act of associating a history of inputs or inferred preferences with a particular user identifier, as disclosed in Hoffberg, *et al.* As such, it cannot be said that Hoffberg, *et al.* discloses signal sets organized according to such user scenarios. Combining Hoffberg, *et al.* with Batten does not render this manner of signal organization obvious, since Batten's artificial neuron system is described in terms of generic signals, and does not employ a group of signal sets categorized according to a particular application or operation that generated the signals therein, or that sets within that group can correspond to an associated range of values for a variable characterizing these user scenarios. The message recognition system of Bellegarda, *et al.* also fails contemplate signals grouped in this fashion, as conceded in the Office Action.

Caulfield is also silent regarding these aspects. Caulfield relates to a method for training a pattern recognition system using an iterative classification technique on sets of training data. However, like the other cited references, Caulfield does not teach or suggest classification of input signals according to the application or operation within an application that generated the input signals.

Amended independent claim 1 goes on to recite, ***identifying additional groups of signal sets, each group having a corresponding variable of the plurality of variables, each signal set of a group having an associated range of values for the corresponding variable****; calculating accuracy scores for each signal set of each additional group using the signal processing engine to be evaluated; applying weight factors to the accuracy scores for the signal sets of the*

additional groups; [and] ***summing the weighted accuracy scores within each of the additional groups to yield additional summed accuracy scores***. Hence, this portion of the independent claim discloses a number of weighted accuracy scores, each score corresponding to a group of signal sets having an associated variable characterizing an attribute of the signals. Contrary to the assertions made in the Office Action, Batten in no way teaches such a signal set grouping, much less determining summed accuracy scores for each group identified in this manner. Batten relates to an artificial neuron system that includes neurons having delta-sigma modulators at their outputs in order to simplify the communication structures within the neuron. These artificial neurons are represented by adder trees comprising a network of selectors and adders, into which a set of signals are fed in order to yield a single state output. Arguing that Batten teaches the groups of signal sets having associated characterizing variables disclosed in amended independent claim 1, the Office Action merely notes that the neurons described in Batten comprise a number of input signal paths. However, these signals are not depicted as being *categorized into groups of signal sets*, wherein each group has a corresponding variable characterizing the signals, and the signals within each group correspond to a range of values for that characterizing variable. Indeed, Batten provides no detail regarding the nature of the signals used to illustrate the neurons, instead describing them only as generic two-state signals. The cited reference does not contemplate groups of input signals, each comprising a signal sets that themselves each fall within a range of values for a signal-characterizing variable associated with that particular group.

Combining Bellegarda, *et al.* with Batten does not render the above signal groupings obvious. Bellegarda, *et al.* relates to a speech and handwriting recognition system that integrates processing of both speech signals and handwriting signals to train word models. However, while Bellegarda, *et al.* teaches that both speech and handwriting signals are recognized and processed by the recognition system, the cited reference does not disclose that groups of signal sets can be processed such that each signal set within a given group corresponds to a range of values for a characterizing variable associated with that group. Rather, the cited recognition system only identifies an input signal as being either a handwriting signal or a speech signal. These categorizations are not analogous to signal groups as disclosed in amended independent claim 1, since these signal groups (handwriting or speech) do not comprise sets of signals that each correspond to a range of values for a variable associated with each respective group. Absent any disclosure of grouped signal sets organized according to these ranges of variable values, it cannot

be said that Bellegarda, *et al.*, alone or in combination with Batten, in any way teaches or suggests calculating accuracy scores for each signal set within these groups, or summing the resulting signal set accuracy scores to yield summed accuracy scores for each group. Neither Hoffberg, *et al.* nor Caulfield remedy these deficiencies.

The subject claims further disclose specific techniques for calculating an overall accuracy for the recognition system using the above-mentioned categorized signals. Specifically, a summed accuracy score can be calculated by combining weighted accuracy scores of each signal set within each group, then weighing and summing each resulting group accuracy score to generate a scope-specific accuracy score. This scope-specific accuracy score can be combined with additional scope-specific accuracy scores for other grouped signal sets having the same group variables as the first set of groups but different input scopes or contexts. The resulting combined scope-specific accuracy score can subsequently be summed with at least one other summed accuracy score relating to a physical attribute of one or more signals (*e.g.* an angle of a handwritten character or spacing between characters), yielding an input accuracy score. Finally, to determine the overall accuracy of the recognition system, this input accuracy score can be combined with the summed accuracy score for a group of signals sorted according to the user scenario described above. Accordingly, amended independent claim 1 goes on to recited, *using summed accuracy scores from at least two separate training sets to create one or more signal processing engines to handle multiple applications to one or more new groups of signal sets for which a frequency of features characteristic of the separate training sets are known or assumed, by weighting the summed accuracy score associated with each training set according to the frequency and then* ***combining the weighted summed accuracy scores to yield scope-specific accuracy scores****; applying weights to each of the scope-specific accuracy scores;* ***summing the weighted scope-specific accuracy scores to yield a combined accuracy score; summing the combined accuracy score with at least one other summed accuracy score relating to a physical attribute of one or more input signals to yield an input accuracy score****; and* ***summing the input accuracy score with a summed accuracy score for a group corresponding to the user scenario variable to yield an overall accuracy score****.*

Batten does not in any way teach or suggest this technique for computing an overall accuracy of a recognition system. Although the Office Action indicates the various adder trees representing different neuron network embodiments, it is noted that no part of these adder trees

serve to calculate an overall accuracy for a recognition system, much less doing so by summing accuracy scores for categorized input signals as described above to yield an input accuracy score, and *further summing this input accuracy score with a summed accuracy score for a group of signal sets categorized according to the user scenarios used to generate the signals*. Moreover, with further regard to the input accuracy score, the cited reference in no way suggests generating such an accuracy score by summing a combined scope-specific accuracy score derived from the aforementioned groups of categorized signal sets with a summed accuracy score relating to a physical attribute of a set of input signals. The subject claims not only disclose this method for calculating an input accuracy score, but further disclose summing this input accuracy score with a summed accuracy score derived from a group of signal sets categorized according to user scenario. Batten's artificial neuron system does not disclose or suggest these specific accuracy calculations.

Bellegarda, *et al*. is also silent regarding these overall accuracy calculations. Like Batten, Bellegarda, *et al*. does not contemplate the particular overall accuracy calculations described above. In particular, Bellegarda, *et al*. does not contemplate summing an input accuracy score with a user scenario-based accuracy score as described above. Moreover, neither Caulfield nor Hoffberg, *et al*. remedy these deficiencies.

Similarly, amended independent claim 16 recites, *the plurality of variables* ***including at least a variable characterizing a user scenario in which a signal was generated, the user scenario including at least one of a software application or an operation performed within a software application****...using summed accuracy scores from at least two separate training sets comprising samples, each separate training set is identified by a feature characteristic determined based upon a demographic characteristic associated with a source of the samples, to create one or more signal processing engines to handle multiple applications to one or more new groups of signal sets for which a frequency of the feature characteristic of the separate training sets are known or assumed, by weighting the summed accuracy score associated with each training set according to the frequency and then combining the weighted summed accuracy scores to yield scope-specific accuracy scores; applying weights to each of the scope-specific accuracy scores; summing the weighted scope-specific accuracy scores to yield a combined accuracy score;* ***summing the combined accuracy score with at least one other summed accuracy score relating to a physical attribute of one or more input signals to yield an input accuracy score****; and* ***summing the input accuracy score with a summed accuracy score for a***

group of signal sets corresponding to the user scenario variable to yield an overall accuracy score. As discussed *supra*, none of the cited references teach or suggest these accuracy determination features.

In view of at least the foregoing, it is respectfully submitted that Batten, Bellegarda, *et al.*, Caulfield, and Hoffberg, *et al.*, individually or in combination, do not teach or suggest all features of amended independent claims 1 and 16 (and all claims depending there from), and as such fail to make obvious the present invention. It is therefore requested that this rejection be withdrawn.

III. Rejection of Claims 6 and 21 Under 35 U.S.C. §103(a)

Claims 6 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable USPN 5768478 (Batten) in view of USPN 6285785 (Bellegarda, *et al.*), USPN 6847731 (Caulfield), USPN 7136710 (Hoffberg, *et al.*), and USPN 5097141 (Thiesson, *et al*). However, claims 6 and 21 depend from amended independent claims 1 and 16, respectively. As discussed in the previous section of the Reply, none of Batten, Bellegarda, *et al.*, Caulfield, or Hoffberg, *et al.* teach or suggest categorizing input signals according to a user scenario variable representing at least one of an application or an operation within an application that generated the respective input signals, as disclosed in those independent claims. Nor do those references disclose determining a summed accuracy score for a group of signal sets categorized in this manner, or summing this user scenario-based summed accuracy score with an input accuracy score to yield an overall accuracy score for a recognition system, as also discussed above.

With regard to Thiesson, *et al.*, it is noted that both the present application and the cited reference were subject to obligation of assignment to the Microsoft Corporation at the time the present invention was made. As such, Thiesson, *et al.* is disqualified as a reference under 35 U.S.C. §103(c).

In view of at least the foregoing, it is respectfully submitted that Thiesson, *et al.* fails to remedy the shortcomings of Batten, Bellegarda, *et al.*, Caulfield, and Hoffberg, *et al.* with respect to the features of amended independent claims 1 and 16. It is therefore requested that this rejection be withdrawn with respect to claims 6 and 21, which depend respectively from those independent claims.

IV. Rejection of Claims 7, 8, 22, and 23 Under 35 U.S.C. §103(a)

Claims 7, 8, 22, and 23 stand rejected under 35 U.S.C. §103(a) as being unpatentable USPN 5768478 (Batten) in view of USPN 6285785 (Bellegarda, *et al.*), USPN 6847731 (Caulfield), and USPN 7136710 (Hoffberg, *et al.*). However, the cited references fail to disclose all aspects set forth in these claims.

As already discussed (and as disclosed in amended independent claims 1 and 16), the groups of signal sets for which accuracy scores are determined can each be associated with a characterizing variable, such that each signal set within a given group is associated with a range of values for the corresponding variable. Adding further detail regarding these variables, amended claim 7 recites, ***at least one variable is a source variable*** *having values characterizing a source of at least one of the signals to be processed,* ***at least one variable is a context variable*** *having values characterizing the context of at least one of the signals to be processed, and* ***at least one variable is a physical variable*** *having values characterizing physical attributes of at least one of the signals to be processed.* Taken together with independent claim 1, from which claim 7 depends, this claim teaches grouping input signals according to these three variables prior to performing the summing processes already discussed. The Office Action concedes that Batten and Bellegarda, *et al.* fails to disclose these variables, but asserts that Hoffberg, *et al.* makes up this deficiency. Specifically, the Office Action indicates several exemplary types of data (speech/character recognition, environment of use, facial recognition, *etc.*) utilized by the cited adaptive programming interface to facilitate predicting user inputs. However, although the Examiner ostensibly equates this data with the variables disclosed in amended claim 7, Hoffberg, *et al.* does not teach that the indicated data is used to categorize signal sets within groups in the manner set forth in amended independent claim 1, from which claim 7 depends. Nor do the other cited references suggest utilizing this data to categorize input signals within variable-specific groups as set forth in claims 1 and 7. Consequently, Hoffberg, *et al.*, alone or in combination with Batten, Bellegarda, *et al.*, and Caulfield, does not in any way suggest grouping signal sets into variable-specific groups, wherein the variables that each correspond to a group include at least a source variable, a context variable, and a physical variable.

Likewise, claim 22 recites, *at least one variable is a source variable having values*

characterizing a source of at least one of the signals to be processed, at least one variable is a context variable having values characterizing the context of at least one of the signals to be processed, and at least one variable is a physical variable having values characterizing physical attributes of at least one of the signals to be processed. None of the cited references teach these aspects, as noted above.

Moreover claim 7 depends from amended independent claim 1, while claim 22 depends from amended independent claim 16. As already discussed, none of Batten, Bellegarda, *et al.*, Caulfield, and Hoffberg, *et al.* disclose all features set forth in those amended independent claims. Claims 8 and 23 have been cancelled.

In view of at least the foregoing, it is respectfully submitted that this rejection should be withdrawn with respect to amended claims 7 and 23.

V. Rejection of Claims 9, 10, 24, and 25 Under 35 U.S.C. §103(a)

Claims 9, 10, 24, and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable USPN 5768478 (Batten) in view of USPN 6285785 (Bellegarda, *et al.*), USPN 6847731 (Caulfield), USPN 7136710 (Hoffberg, *et al.*), and USPN 5097141 (Thiesson, *et al*). However, claims 9 and 10 depend from amended independent claim 1, while claims 24 and 25 depend from amended independent claim 16. As already discussed, none of these references disclose all aspects of those independent claims. It is therefore respectfully submitted that this rejection should be withdrawn with respect to claims 9, 10, 24, and 25.

VI. Rejection of Claims 11, 12, 26, and 27 Under 35 U.S.C. §103(a)

Claims 11, 12, 26, and 27 stand rejected under 35 U.S.C. §103(a) as being unpatentable USPN 5768478 (Batten) in view of USPN 6285785 (Bellegarda, *et al.*), USPN 6847731 (Caulfield), USPN 7136710 (Hoffberg, *et al.*), USPN 5097141 (Thiesson, *et al.*), and USPN 7167587 (Ii, *et al.*). However, claims 11 and 12 depend from amended independent claim 1, while claims 26 and 27 depend from amended independent claim 16. As discussed above in connection with those independent claims, none of Batten, Bellegarda, *et al.*, Caulfield, Hoffberg, *et al.*, or Thiesson, *et al.* disclose generation of accuracy scores using signal sets grouped according to a user scenario variable, where the user scenario variable values represent an application or operation within an application that generated the respective signals. Nor do these

references disclose computing an overall accuracy score for a recognition system by summing an input accuracy score with a summed accuracy score for a group of signal sets corresponding to this user scenario variable. Ii, *et al.*, which relates to a pattern classifier that sequentially compares an input pattern with each of a set of rungs representing an output classification, also fails to disclose these aspects. It is therefore respectfully requested that this rejection be withdrawn.

VII. Rejection of Claims 14 and 29 Under 35 U.S.C. §103(a)

Claims 14 and 29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 5768478 (Batten) in view of USPN 6285785 (Bellegarda, *et al.*), as applied to Claim 13 above, and further in view of USPN 5142666 (Yoshizawa, *et al.*). However, claims 14 and 29 depend from amended independent claims 1 and 16, respectively, and Yashizawa, *et al.* fails to make up the aforementioned shortcomings of Batten and Bellegarda, *et al.* with respect to the features of those independent claims. Specifically, Yashizawa, *et al.*, which relates to a learning system employed in a neuron computer, fails to disclose the above-mentioned functionality of the user scenario variable, or utilization of a group of signal sets corresponding to such a variable to determine an overall accuracy for a recognition system as set forth in the amended independent claims. In view of these deficiencies, it is respectfully submitted that this rejection should be withdrawn with respect to claims 14 and 29.

VIII. Rejection of Claims 15 and 30 Under 35 U.S.C. §103(a)

Claims 15 and 30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 5768478 (Batten) in view of USPN 6285785 (Bellegarda, *et al.*), USPN 6847731 (Caulfield), and USPN 7136710 (Hoffberg, *et al.*) as applied to claim 1 above, and further in view of USPGPubN 20050049983 (Butler, *et al.*). However, Butler, *et al.*, which relates to a genetically adaptive signal classification system employing modifiable weight vectors, fails to remedy the previously discussed deficiencies of the other cited references with regard to the functionality of the user scenario variable disclosed in amended independent claims 1 and 16. It is therefore respectfully submitted that this rejection should be withdrawn with respect to claims 15 and 30, which depend from those independent claims.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP2220US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

AMIN, TUROCY & CALVIN, LLP

/Himanshu S. Amin/
Himanshu S. Amin
Reg. No. 40,894

AMIN, TUROCY & CALVIN, LLP
127 Public Square
57th Floor, Key Tower
Cleveland, Ohio 44114
Telephone (216) 696-8730
Facsimile (216) 696-8731